



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/824,742	04/15/2004	Lid B. Wong	BIO1819P0031US	7061

32116 7590 01/18/2007
WOOD, PHILLIPS, KATZ, CLARK & MORTIMER
500 W. MADISON STREET
SUITE 3800
CHICAGO, IL 60661

EXAMINER

KIANNI, KAVEH C

ART UNIT	PAPER NUMBER
----------	--------------

2883

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/18/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

31

Office Action Summary	Application No. 10/824,742	Applicant(s) WONG ET AL.	
	Examiner Kianni C. Kaveh	Art Unit 2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) 1-33 and 43-49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 34-42 is/are rejected.
- 7) ☐ Claim(s) 42 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

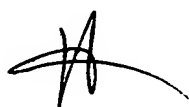
Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.



Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant's election with traverse of claims in response/amendment submitted on 10/23/06 is acknowledged. No grounds for such traversal is provided by the applicant. This is not found persuasive and requirement is still deemed proper and is therefore made FINAL.

This application contains claims 1-33 and 43-49 drawn to an invention nonelected with traverse in Paper No. 5. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 34 and 42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 34 and 42 recites the limitation 'wherein said motions are less than 10 microns in magnitude in 2nd lines. Although it may be construed such limitation as a new matter under 112, First Parag, since such limitation is not found throughout the specification, nonetheless, it indeed would make such claim as indefinite as to understand as how

Art Unit: 2883

exactly such magnitudes are measured or obtained in order to apply the teachings of the prior art accordingly. Correction is required.

Claim Objections

Claims 42 is objected to because of the following informalities: the word simultaneous may need to be 'simultaneously' in order to make sense of the claim, otherwise, it may have to be rejected under USC 112 Second Parag. as being indefinite. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 34-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over combination of Ozanich (US 2002/0011567) and Rollins et al. (US 200/30137669) .

Regarding claims 34, 36 and 42 Ozanich teaches an apparatus for measuring non-stationary oscillatory motion of a sample wherein said motions are less than 10 microns in magnitude (shown in at least fig. 1c, also par. 0101; The preamble is not given the effect of a limitation unless it breathes life and meaning into the claim. In order to limit the claim, the preamble must be "essential to point out the invention defined by the claim." Kropa v. Robie, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951)),

said apparatus comprising:

a light source 120; an illuminating optical fiber coupled to said light source 120 (see parag. 0055 and 0014);

and a plurality of detecting optical fibers positioned systematically around said illuminating optical fiber in a predetermined arrangement (see at least fig. 1-3, item detecting fibers and par. 0054) and coupled to receive reflected backscattered light from said sample (see at least parag. 0002 and 0104).

a plurality of detectors, each detector being coupled to a pair of optical fibers comprising a detecting optical fiber and a reference optical fiber for each simultaneous independent nonstationary motion measurement (see 0110; also at least fig. 1 and 1D, item light detectors 170/200 having a pair of reference light detection fiber output as well as detecting light reflected fiber output, and parag. 0081, specifically last 2 lines of page 8-first 6 lines of page 9).

However, Ozanich does not explicitly state that the above sample is that the above reference optical fiber is 'modulating' and a beam splitter coupled to said light

source and the detecting optical fibers are single mode optical fibers. Nonetheless, that a plurality of optical sources 120/123 such lasers are used as signal sources producing spectra frequency carrying signal. These limitations are more specifically taught by Rollins. Rollins teaches an apparatus for measuring non-stationary oscillatory motion of a sample that includes modulating optical fiber (shown in at least fig. 11). Thus, Rollins provides additional teachings of imaging of moving objects as tissue. Thus, it would have been obvious to a person of ordinary skill in the art when the invention was made to combine the teachings of Ozanich with that of Rollins concerning modulating reference signal as taught more specifically by Rollins in order to produce an apparatus for measuring non-stationary oscillatory motion of a sample that includes all above limitations provided that a single mode fiber is extremely convention and widely used in fiber optic systems and since such detection/measurement and analysis of input/output signal transmission/receiving of optical signal in the apparatus would provide signal representation of a sample/object characteristics (see 0002).

Regarding claims 35 and 37-41, as stated in rejection of claims 34, above, Ozanich further teaches wherein said light source comprises a laser light source 120; wherein said plurality of detecting optical fibers are arranged symmetrically around said illuminating optical fiber (shown in at least fig. 1); a modulating optical fiber bundle having a plurality of modulating optical fibers (see at least fig. 1, item references coupled to the source which are light coupling reference fibers/fiber-bundle); wherein each detecting optical fiber of said plurality of detecting

Art Unit: 2883

optical fibers is coupled to a modulating optical fiber (see at least parag. 0081, specifically last 2 lines of page 8-first 6 lines of page 9); a plurality of detectors, each detector being coupled to a pair of optical fibers comprising a detecting optical fiber and a spectra frequency carrying optical fiber (see at least fig. 1 and 1D, item light detectors 170/200 having a pair of reference light detection fiber output as well as detecting light reflected fiber output, and parag. 0081, specifically last 2 lines of page 8-first 6 lines of page 9).

- *Below is the non-final rejection of at least claims 34-43 that was originally rejected in the parent applicant, now abandoned, in which is pertinent to rejection of these claims as follows:*

Claims 34-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,807,264 to Paltieli, in view of Yang, U.S. Patent Pub. No. 2002/0101593).

Paltieli (264) discloses an apparatus that includes an endoscope in the form of a long, slender, rigid tube 2 insertable at one end into the body to be examined. The opposite end of the rigid tube 2 is connected via a flexible sleeve 4 to a source of light 6 for illuminating the interior of the body to be examined, and a light measuring circuit 8 for measuring the back-scattered light from the interior of the examined body.

The source of light 6 is a laser. It is coupled via a fiber coupler 10 to the end of a single mode fiber 11 extending via the flexible sleeve 4 into the endoscope 2 for transmitting the light from the laser to the examined body. Endoscope 2 and the flexible sleeve 4 include two further optical fibers 12, 13; these are multimode

fibers and are connected to the light measuring circuit 8 for transmitting thereto the back-scattered light from the examined region.

The light measuring circuit 8 is more particularly illustrated in FIG. 2. It includes: two light detectors 14, 16, one for each of the two light-collecting fibers 12, 13; two preamplifiers 18, 20 for preamplifying the outputs of the two light detectors 14, 16; and a differential amplifier 22 for receiving the amplified outputs of the two light detectors. The output of differential amplifier 22 thus corresponds to the momentary difference in the amount of light received by the two light detectors 14, 16 from their respective collector fibers 12, 13.

The output from differential amplifier 22 is fed to a bandpass filter and gain control unit 24 to amplify the range of frequencies of typical cilia beats (0.5-30 Hz). The gain of unit 24 is controlled by a variable-gain potentiometer 26 (FIG. 1). As further shown in FIG. 1, the output from the light measuring circuit 8 is fed, via an analog-to-digital converter 28 to a digital processor 30 for processing and display via a display unit 32. See Column 2, line 47-67; and Column 3, line 1-15.

Paltieli (264) also discloses that each light detector 14, 16 is preferably a photodiode and includes a narrow bandwidth filter 14a, 16a (FIG. 2) for passing only the wavelength of the laser 6, thereby eliminating the effects of surgical ambient or other extraneous white light not supplied from the laser. As indicated earlier, utilizing two collecting optical fibers reduces the artifacts originating from breathing and heartbeat motions of the patient and hand motions of the surgeon or physician since such motions would affect both optical fibers in the same manner and thus tend to cancel out by the differential amplifier 22. On the other hand, fluctuations resulting from ciliary motion are detected by the two collector fibers in two different laser coherence areas (phases), which are random and therefore do not cancel out. As a result, a relatively high signal-to-noise ratio is produced at the output of the differential amplifier 22. See Column 3, line 50-65. Paltieli further discloses that processor 30 may be a personal computer, which samples the output signals from the analog-to-digital converter 28 according to user-specified sampling parameters, and stores the data in the computer memory in a direct memory access mode. This

Art Unit: 2883

enables accumulating and processing the data simultaneously. User-chosen parameters would include: averaging time (in minutes), the number of sampling points N (e.g., 32, 64, 128, 256, or 512), and maximum frequency (cycles/sec.). The maximum frequency (F_{max}) determines the sampling rate, which is set at $2 \times F_{max}$. For each array of N sampled data points, Fourier transformation and squaring yield the power spectrum of all the frequencies up to F_{max} . A larger number of sampling points N gives the same overall shape of the power spectrum at higher frequency resolution, but obviously takes longer to sample and calculate, and therefore yields a slower real-time response to the operator. The averaging time determines how many separate power spectra will be averaged in the final power spectrum. The parameters that gave an optimum signal to noise ratio, with fast response time were found to be: average time of 0.6 min, 128 sampling points, and maximum frequency of 20 Hz, giving a display of updated spectrum ever 3.2 seconds, and final frequency power spectrum averaged for 11 spectra. Nine measurements of ciliary beat frequency (CBF) of fimbria of excised human fallopian tubes were made with these parameters. The mean \pm SEM value for the CBF was 5.9 ± 0.5 (4.7-8.4) Hz. FIG. 9 illustrates the results as displayed in the computer monitor (32, FIG. 1) which was obtained during laparoscopy of one of the women examined (Case No.2), utilizing the parameters specified in FIG. 9. The obvious frequency peak around 4.7 Hz pointed by the cursor corresponds to the CBF. See Column 4, line 31-48; and Column 5, line 1-9. It is implied herein that the use of two different laser coherence areas in accordance with Paltieli (264) is equivalent to the use of modulated light as recited in. Paltieli (264) as applied above does not disclose the use of a beam splitter. However, Yang (593) discloses in FIG. 8 a fiber optic system 200 for light delivery and/or collection in conjunction with the light scattering spectroscopic systems and methods of the invention described previously. A light source provides a beam 202 that includes at least two wavelengths λ_1 , λ_2 , which are coupled to the proximal end of optical fiber 204. A beam splitter 206 incorporated into the fiber optic system delivers light components through fibers 208 and 210, and through lenses 216 and 214, respectively. A first

light component is reflected by moving mirror 220 traveling in direction 220, and returns through fibers 210 and 212. A second light component is directed onto tissue 218, and light scattered by the tissue is returned through fibers 208 and 212. Dichroic mirror 230 *separates the two wavelengths A_1 and A_2 , which are* detected by *detectors 240 and 242, respectively*. The heterodyne detection systems 250 and 252 are used to process the detected systems as described previously in connection with FIG. 1. The systems described herein can be used in conjunction with standard endoscopes to provide diagnostic information retrieved from lumens or tissue within the human body in vivo. See Paragraph [0064]. Therefore it would have been obvious to one of ordinary skill in the art that the cilia motion detection apparatus and method of Paltieli (264) can be modified to use a beam splitter in accordance with Yang (593), to provide diagnostic information retrieved from lumens or tissue within the human body in vivo.

Response to Arguments and Amendment

Applicant's argument filed on 10/23/06 have been fully considered but they are not persuasive.

Applicant alleges that Ozanich's teachings are directed to static and stationary samples and that there is really only one fiber to output detecting spectrum from the sample.

Examiner responds that Applicant merely speculate as there is only one output fiber and that the sample of Ozanich is indeed in motion and nonstationary (see 0110; also at least fig. 1 and 1D, item light detectors 170/200 having a pair of reference light detection fiber output as well as detecting light reflected fiber output, and parag. 0081, specifically last 2 lines of page 8-first 6 lines of page 9). Secondly, the applicant has not narrowed

Art Unit: 2883

the scope of the invention as to overcome the prior art of the record with regard to the combinational teachings of Ozanich and Rollins nor the combinational teachings of Paltieli, in view of Yang.

Applicant is advised to appropriately narrow the scope of the claims in order to allow the claims.

THIS ACTION IS MADE FINAL

This action in response to applicant's amendment made FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Applicant's election with traverse of claims in response/amendment submitted on is acknowledged. No grounds for such traversal is provided by the applicant. This is not found persuasive and requirement is still deemed proper and is therefore made FINAL.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to K. Cyrus Kianni whose telephone number is (571) 272-2417.

The examiner can normally be reached on Monday through Friday from 8:30 a.m. to 6:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font, can be reached at (571) 272-2415.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

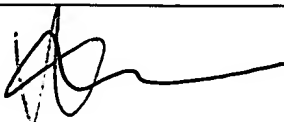
(703) 872-9306 (for formal communications intended for entry)

or:

Hand delivered responses should be brought to Crystal Plaza 4, 2021 South Clark Place, Arlington, VA., Fourth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956.

12/31/06



KAVEH KIANNI
PRIMARY EXAMINER